Indoor Air Quality Self Help Information Bulletin

Typically there are many factors involved in maintaining acceptable indoor air quality. This bulletin contains tips and steps that can be taken by non-technical people to evaluate, adjust, and recognize some of these factors.

1. Check all thermostatic controls for a switch controlling the fans (it's usually on the bottom). Of the two typical positions, "on" or "automatic", the fan switch should be in the "on" position whenever the workspace is occupied. In the "automatic" position ventilation fans will only run when there is a need to adjust temperature within the space, as a result there can be long periods of no air circulation. Some systems cycle on and off either due to a computer driven duty cycle or by electrical clock settings for occupied and unoccupied hours. Power failures can throw off the settings. Attach a tissue (piece of very light paper) to the air supply diffuser. Its movement will show when air is being supplied. A sheet of paper will cling to an operating air return/exhaust vent. Air movement should be continuous throughout the workday.
2. Locate the outside air intake for the ventilation system(s) and make sure the louvers are operating, are open and that any screening is unobstructed. A sheet of paper will cling to an intake vent that is at least partially functioning. It is not uncommon to find the dampers closed for reasons of economy and energy management or automatically by a fault control system. Note whether there are any contaminant sources such as rotting material, bird droppings, etc.
3. Assure that the outside air intakes are not located too near (and down wind from) any of the following: building exhaust vents; loading docks and parking areas where motor vehicle exhaust is generated or collects; sanitary sewer stacks and rest room exhaust vents; and cooling towers. If necessary, raise stacks or relocate intakes or exhausts.
4. Air supply and return/exhaust vents within occupied spaces should be checked to assure that they are not blocked or closed. This often happens as a result of occupant response to drafts and temperature issues and to improper placement of boxes or furniture.
5. An adequately balanced ventilation system has vent supply and exhaust airflow rates appropriate for the uses and occupancy of the various spaces the vents serve. As a result, air quality perceptions and temperatures will be largely uniform from one area to the next. Where they are not, over-time individual vents may have been changed from original settings or there may have been changes in occupancy and space design. A common problem is new walls or tall (over 54 inches) partitions causing a localized blockage or an overabundance of ventilation. Additional return and supply air vents or other means of improving ventilation effectiveness may be needed. A re-balancing of the ventilation system to reflect current use and occupancy should be done by a professional balancing company. Any changes that result should be reflected on such architect drawings (plans) as exist, to reflect current usage.
6. The capacity of the ventilation system to supply both total and fresh air for the occupancy and size of the space is often critical. Exhaust ventilation in restrooms and other areas should be provided and operating at all times of building occupancy. State Building Code requirements and our Program's suggestions can be found in our Mechanical Ventilation Systems and Air Quality bulletin (Bulletin 392).
7. Preventive maintenance is essential to the operation of all mechanical systems. Heating, Ventilating, Air-conditioning (HVAC) equipment is no exception. The system should be professionally checked and serviced, periodically, to assure that all components (belts, motors, baffles, dampers and ductwork) are working and functioning within specifications. (See our bulletin on HVAC Systems and Building Maintenance Guidelines (Bulletin 391).
8. Elements within the ventilation system such as the condensate drip pans and heat exchanger coils need to be checked and cleaned periodically. Clogged drip pan drains can lead to microbiological growth and the release of allergens or pathogens into supply air.
9. Filters on ventilation units should be changed with a regular frequency (often seasonally). This should be documented (filters can be dated with a marker) to assure compliance with the filter change policy. Filters should have a minimum efficiency of 25-30 percent. Higher efficiency filters (60%) are preferred, especially where there is a lot of dust generated within or brought into the space. (See our bulletin on HVAC Systems and Building Maintenance Guidelines (Bulletin 391).

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10. If windows are present and able to be opened, they should have screening and perhaps appropriate deflectors, to allow use without drafts. For more information on the use of natural ventilation, please see our Guidelines for Natural Ventilation in the Workplace bulletin (Bulletin 394).
11. General cleanliness, in general and specific work areas, is an important component of perceived indoor air quality. Sometimes cleaning materials or the timing of cleaning adversely affects air quality. Often these issues can be improved by increasing feedback between management, employees, and cleaning staff.
12. The grillwork on air supply and exhaust vents naturally collect dust over time. It is common to see dust build-up on exhaust vents and dust patterns on ceiling tiles next to supply vents. A quick build-up of dust, following surface cleanings, may indicate a need for higher filter efficiency, a breakdown of filtration, or the presence of dust within ductwork. Grillwork should be cleaned periodically.
13. Contaminants generated by specific processes (e.g. printing, photo copying, document duplication and binding areas) can be significant contributors if the ventilation is not adequate for the usage level and type of process. For the highest generators dedicated local exhaust ventilation may be needed. Air from areas of significant generation should not be re-circulated into the general ventilation system. Such areas should be under a negative air pressure relative to adjacent areas. Less significant sources should have good general ventilation. Equipment such as photocopiers should be placed such that general emissions do not affect individuals at their workstations. Also job rotation can significantly reduce individual exposure associated with using the equipment.
14. Areas under renovation or construction should be isolated from other non-construction areas, through the use of physical barriers and the separation of associated ventilation systems. This is applicable for activities such as painting and carpet laying. If possible, this type of work should be conducted in the "off hours" in the evenings and on weekends when normal occupancy is diminished and/or not scheduled. Supplying a maximum amount of ventilation to these areas, initially on a 24-hour basis, can assist in the rapid reduction of contaminant levels. See our Construction and Renovation IAQ bulletin (Bulletin 388).
15. In the heating season, low humidity can be a problem. Lowering room temperatures a few degrees can significantly improve the situation. Installation of humidifiers is not recommended as poor maintenance, a common occurrence, can lead to microbial contamination problems. See our Thermal Comfort Guidelines for IAQ bulletin (Bulletin 389) for more information.
16. Any water damaged porous materials (e.g. ceiling tiles, carpet and wallboard) that can not be dried out and cleaned within 48 to 72 hours should be removed and replaced. Bacteria and mold can begin to grow within this period of time. For more information see our Mold and Indoor Air Quality Bulletin (Bulletin 393).
17. Environmental Tobacco Smoke (ETS) has been identified as a class "A" carcinogen by the Environmental Protection Agency (EPA). Eliminating or reducing the contamination of the air supply in the workplace with cigarette smoke is a superior method of improving the indoor air quality. Banning of smoking or restricting it to designated areas that have their own exhaust ventilation with no re-circulation are the best methods of dealing with this source of pollution.
18. It is our experience that once a building has had an air quality concern, it is not uncommon for the same problems and concerns to continue for years to come. Development of an air quality management plan will help maintain good indoor air quality. An air quality management plan includes information such as who at the facility will be responsible for addressing IAQ issues, who is responsible for HVAC maintenance, how often HVAC systems will be maintained, etc. It also describes how building occupants can have their air quality and comfort concerns addressed and includes a plan to inform building occupants of any changes which could affect air quality, such as painting or construction work. There are several sources of information that may help you in establishing such plans. These include: EPA Tools for Schools (202-512-2250); OSHA Proposed Indoor Air Quality Standard-(Federal Register April 5, 1994); and EPA/NIOSH Building Air Quality: A Guide for building Owners and Facility Managers (202-512-2250).
19. Additional information on IAQ issues at work and home may be obtained by contacting the EPA Indoor Air Quality Hot Line at 1-800-438-4318.